

Application No.: 10/077,616
Amdt. dated June 28, 2004
Reply to Final Office Action of March 29, 2004

PATENT
Docket No. 14402-0072

REMARKS

Claims 1-6 are currently pending in the present application. Claims 1-6 of the present application stand rejected. Claim 1 has been amended. The Applicant respectfully traverses the rejections to the claims and submits that claims 1-6 are in condition for allowance.

Claims 1-6 of the present application stand rejected under 35 U.S.C. §112 as being indefinite for failing to particularly point out and distinctly claim the subject matter. In response, the Applicant has amended claim 1 and respectfully submits that claim 1 is in condition for allowance. Further, for at least the same reasons, the Applicant submits that claims 2-6, which depend on claim 1, are also in condition for allowance.

Claims 1-3 and 6 are rejected under 35 USC §102(e) or, in the alternative, under 35 USC §103(a), as being unpatentable over United States Patent No. 6,473,178, issued to Shimaoka (hereinafter Shimaoka). The Applicant respectfully traverses the rejections, and respectfully submits that claims 1-3 and 6 are patentable over Shimaoka.

For a reference to anticipate a claim under 35 U.S.C. §102 the reference must teach every element of the claimed invention. (See MPEP §2131). Similarly, to establish a prima facie case of obviousness, the Examiner must meet three basic criteria. First, there must be some suggestion or motivation, either in the reference themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or to combine the teaches of the references. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. (See MPEP §2143.03).

Claim 1 of the present application is directed to a particle size distribution measuring apparatus and includes a sample cell, a light source section irradiating two or more laser lights having a plurality of wavelengths to the sample cell, at least two detectors configured to measure an intensity of a direct light passing through the sample cell and light scattered

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by particles at respective scattering angles, each detector configured to measure the intensity of light of one of the plurality of wavelengths within the same measuring range, and an arithmetic processing section configured to determine the particle size distribution by using the intensity of the laser light at the first and second wavelengths as measured by the detectors.

In the Final Office Action, the Examiner states "Shimaoka discloses a sample cell (52) for receiving particles (P) therein, a light source section (51a, 61, 61a) for irradiating two or more light beams having a plurality of wavelengths (600-800 nm), a detector unit (53b, 54, 55, 62, 63) for measuring the intensity of a direct light passing through the sample cell and light scattered by the particles at respective scattering angles, and an arithmetic processing unit (57, 68) for determining the particle size distribution by using the laser light at the first and second wavelengths in the whole size of the particle size to be measured to compensate for the sensitivity of the region." Further, the Examiner states "it is inherent that both light sources are semiconductor lasers."

With respect to the rejections to claims 1-3 and 6 under 35 U.S.C. §102(e), the Applicant respectfully submits that Shimaoka fails to teach every element of the claimed invention as required by MPEP §2131. More specifically, claim 1 recites a light source section of irradiating two or more laser lights having a plurality of wavelengths to the sample cell. In contrast, Shimaoka discloses a particle size analyzer utilizing a semiconductor laser (51a) and a light source (61) capable of outputting a light beam having a wavelength shorter than the laser, and a filter (61a). Shimaoka fails to teach or suggest that the light source (61) comprises a laser. As such, the Applicant respectfully submits that Shimaoka fails to teach or suggest all the limitations of claim 1.

Further, claim 1 of the present application recites at least two detectors configured to measure an intensity of a direct light passing through the sample cell and light scattered by the particles at respective scattering angles, each detector configured to measure the intensity of light of one of the plurality of wavelengths within the same measuring range. In contrast, Shimaoka discloses a system wherein "a particle size distribution in a region of

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particle diameters of the order of sub-micron is calculated from space intensity distribution data of the scattered light obtained from the semiconductor laser 51a and the measurement optical system corresponding thereto, and at the same time a particle size distribution having smaller particle diameters in the order of sub-sub-micron is calculated from the space intensity distribution data of the scattered light obtained from the light source 61 and the measurement optical system corresponding thereto." (See Col. 4, l. 52-61). As such, the Applicant respectfully submits that Shimaoka fails to teach or suggest all the limitations of claim 1.

In the Final Office Action, the Examiner further states "it would have been obvious to one of ordinary skill in the art at the time invention was made to have placed the light source (61) of Shimaoka by a laser source because the device would function in the same manner." For the reasons stated above, the Applicant respectfully submits that Shimaoka fails to teach or suggest all the limitations of claim 1 as required by MPEP §2143.03, and, therefore, fails to anticipate claim 1.

Further, the Applicant respectfully submits that claim 1 of the present application teaches away from the device and method disclosed in Shimaoka. As described in the present application and shown in Figure 2, when using a single laser light L_a there exists a region of the particle size at which the sensitivity of the scattered light measured by the detectors becomes too weak at any scattering angle (i.e. low-sensitivity region). This low sensitivity region is largely dependent on the refractive index resulting from the particle and a wavelength of the light used to irradiate the particle. Therefore, it is possible to adjust the low-sensitivity region by changing the wavelength of light emitted by the light source. As such, the system disclosed in claim 1 utilizes a light source irradiating two or more laser lights having a plurality of wavelengths to a sample cell. Therefore, during use, the system disclosed in claim 1 of the present application produces a first and second low-sensitivity region relating to the wavelengths of the two or more laser lights irradiating the sample. These two low-sensitivity regions do not overlap. As such, when combined, the specific region of particle size of low sensitivity may be eliminated across the entire measuring range by using two or more laser lights having a plurality of wavelengths to irradiate a sample.

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In contrast, Shimaoka discloses a particle size distribution measuring apparatus configured to measure submicron particle diameters calculated from space intensity distribution data of scattered light obtained from semiconductor laser (51a) in the measurement optical system corresponding thereto, and smaller sub-sub-micron particle diameters calculated from the space intensity distribution data of scattered light obtained from the light source (61) and the measurement optical system corresponding thereto. Therefore, Shimaoka teaches a system using a first light source to measure a first measurement region and a second light source to measure a second measuring region, unlike the claim 1 of the present application which measures the particle size distribution within the same region with two or more light sources. As such, the Applicant respectfully submits that claim 1 teaches away from device recited in Shimaoka. For at least the same reasons, the Applicant respectfully submits that claims 2, 3, and 6, which depend on claim 1, are also in condition for allowance.

Claims 4 and 5 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Shimaoka. The Applicant respectfully submits that the rejection to dependent claims 4 and 5, which depend on claim 1, must fail for at least the same reasons as set forth in the traversal of the rejection of claim 1 under 35 U.S.C. §102 as described above. In short, Shimaoka fails to disclose or suggest all the elements of independent claim 1 and, therefore, fails as a primary reference at the outset. Therefore, the Applicant respectfully submits that claims 4 and 5, which depend on claim 1, are in condition for allowance.

In view of the foregoing, the applicant respectfully submits that the pending claims are in condition for allowance. Reconsideration and early allowance are respectfully and sincerely requested.

If it is felt for any reason that direct communication with the Applicant's attorney would serve to advance the prosecution of this case to finality, the Applicant is invited to call the undersigned attorney at the below listed telephone number.


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PATENT
Docket No. 14402-0072

The commissioner is hereby authorized to charge for any additional filing fees or credit any overpayment to deposit account number 50-1329. A duplicate copy of this sheet is attached.

Respectfully submitted,

Dated: June 28, 2004


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